JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1987, 20, 243–252 NUMBER 3 (FALL 1987)

THE INFLUENCE OF CHILD-PREFERRED ACTIVITIES ON AUTISTIC CHILDREN'S SOCIAL BEHAVIOR

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One of the characteristics of autistic children is severe social avoidance behavior. We assessed whether the type of activity (child-preferred vs. activities that were arbitrarily determined by an adult) engaged in during an interaction was correlated with the amount of social avoidance behaviors these children exhibit. Results revealed a negative correlation between appropriate child-preferred activities and social avoidance behavior. Additional analyses revealed that (a) social avoidance behaviors could be manipulated within a reversal design, and would predictably decrease when the children were prompted to initiate appropriate child-preferred activities; and (b) these procedures could be used to teach children to initiate child-preferred activities in community settings, resulting in reductions in social avoidance responses even after the therapist's prompts were completely removed. These data suggest that the manipulation of task variables may influence the severe social unresponsiveness that is characteristic of autistic children.

DESCRIPTORS: social behavior, avoidance responding, autism, preferred activities, clinical research

One of the most typical characteristics of autistic and other severely handicapped children is a severe and pervasive social unresponsiveness (Hops, 1983; Kanner, 1943; Schreibman, Koegel, Charlop, & Egel, 1982). Although this has been a difficult research area, a few initial investigations have reported success in getting autistic children to respond socially in appropriate ways (Gaylord-Ross, Haring, Breen, Lee, & Pitts-Conway, 1984; Shafer, Egel, & Neef, 1984; Strain, Kerr, & Ragland, 1979).

To improve specific nonverbal behaviors that exemplify a lack of social responsiveness (e.g., gaze aversion; McConnell, 1967), studies manipulating the consequences of such behaviors have been conducted. Other researchers have suggested the importance of examining antecedent stimuli controlling these behavioral characteristics. For example, Richer and Coss (1976) showed that when an adult was attending to an autistic child, the child displayed high levels of social avoidance responses (e.g., gaze aversion, expressionless face, and head hanging). In contrast, Dawson and Adams (1984) found that these children were more socially responsive, showed more eye contact, and played with toys in a less perseverative manner when an adult imitated their behavior. These reports suggest that social avoidance behaviors may be particularly strong during social interactions that are arbitrarily determined by an adult. As the major type of interactions between adults and severely handicapped children seem to be adult-directed demands or requests (Bernard-Opitz, 1982; Duchan, 1983), this finding could have important implications for the social behavior of autistic children.

This research was supported by U.S. Public Health Service Research Grant No. MH 28210 and MH 39434 from the National Institute of Mental Health and U.S. Department of Education–Special Education Program Research Contract No. 300-82-0362.

We are grateful to Miriam Carter, Connie Perrillo, Mary Blatchey, Jackie Webb, Kathy Weeks, Susan Cunningham, Mary Doyle and Mary Zobell. We are especially grateful to Dr. Robert Horner and Holly Medek for their helpful comments on earlier drafts of this manuscript.

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We therefore investigated (a) whether engaging in (appropriate) child-preferred activities (as opposed to engaging in activities that were arbitrarily determined by an adult) would be related to the amount of social avoidance behavior exhibited by autistic children, (b) whether prompting the children to initiate high levels of child-preferred activities would reduce their social avoidance behavior, and (c) whether these children would continue to initiate child-preferred activities with corresponding reductions in social avoidance behavior in community settings after prompts were removed.

STUDY 1: NATURALISTIC OBSERVATIONS

Method

Subjects

Four males and 6 females, each of whom frequently exhibited social avoidance behaviors, participated as subjects. All of the subjects were mentally retarded and exhibited characteristics of autism as defined by the U.S. National Society for Children and Adults with Autism (Ritvo & Freeman, 1978). The subjects ranged in age from 4 to 13 years. Their social ages as measured by the Vineland Social Maturity Scale ranged from 1.6 years to 7.4 years. Although the subjects' performance on standardized intelligence tests (i.e., Stanford Binet Intelligence Scale, Merrill-Palmer Scale) was erratic and formally untestable, their mental ages were estimated to be similarly low (ranging from 3 to 5 months to 8.0 years) and their estimated IQs ranged from 10 to 75. Three of the subjects were primarily nonverbal and demonstrated minimal social communicative behavior. The remaining seven demonstrated both echolalic and occasional communicative speech. In addition, the subjects had minimal self-help behaviors, and frequently engaged in self-stimulatory and/or tantrum behavior.

Setting and Procedures

Each session was conducted in a simulated living room setting, with toys scattered on the floor. The room contained a one-way mirror that concealed a videotape camera. To provide opportunities for social interaction, the child's therapist or mother brought the child into the room, where the child was introduced to an adult participant who was naive to the experimental hypothesis. Each session was conducted by a different adult who was unfamiliar to the child. The adults were male and female college students with varying degrees of experience with autistic children. The only instruction given to the adult was to play with the child and to change toys about every minute. Each session was videotaped for 9 min.

Measurement of Dependent Variables and Reliability

Child-preferred play. This measure was defined as appropriate play behavior that the child initiated or, if initiated by the adult, had previously been initiated by the child. Play was defined as manipulating a toy in the manner in which it was meant to be used. Such activities ranged from object-appropriate sensorimotor play, consisting of actions such as appropriately shaking a maraca, to early levels of symbolic play, such as talking on a toy phone (Piaget, 1962). Child-initiated play behaviors were those that were not preceded by adult directions within 10 s. Adult-determined activities were those guided by the adult's verbal statements, gestures, or physical prompts that served to specify the form of the child's play behaviors.

The duration of child-preferred activities within each session was measured independently by two trained observers. Each observer pressed the button of an event recorder when the adult and child engaged in child-preferred activities together, and then released the button when the child-preferred activities were terminated. These activities were considered to be terminated when the adult initiated a new play activity that was not child preferred or if the child stopped playing with the toy.

Social avoidance behaviors. These were defined as behaviors that produced a reduced amount of interaction between the adult and the child. The avoidance behaviors represented *active* attempts to avoid the adult. The particular behaviors scored

were (a) looking away from the adult and/or their mutual play activity (not including momentary attention to a competing stimulus); (b) moving away from the adult; (c) pushing the adult away; (d) pushing away the toy that the adult presented; (e) pulling away from the adult; (f) hanging head; (g) closing eyes; and (h) not coming when called. These behaviors were selected because of their frequent description in the literature (e.g., Richer & Coss, 1976). The duration of social avoidance behavior was measured in the same manner as the child-preferred activities (see above).

Subjective measures of social responsiveness. These were recorded by two female college students who had no previous training with handicapped children. The observers were instructed to rate all videotaped interactions according to a 5-point scale, with a score of 1 representing "not at all" and a score of 5 representing "very much" with respect to the following questions: (a) "How interested did the child seem to be in continuing this social interaction?" and (b) "How actively involved was this child in the social interaction?" The data for social responsiveness were recorded by observing the child for the 18 consecutive 30-s intervals within the above-described sessions. At the end of each of these 9-min sessions, the ratings from each 30-s interval were added together and divided by the total number of intervals to arrive at a mean rating for each session.

Reliability

Two observers independently recorded the duration of social avoidance behaviors and child-preferred play for 50% of the sessions, selected on a random basis. The observers were trained undergraduate students with extensive backgrounds in the recording of operationally defined behavior of handicapped children. In order to increase the precision of the reliability calculation for this duration measure, the data from the two observers were then compared on a 30-s block-by-block basis (Sulzer-Azaroff & Mayer, 1977). An agreement was defined as both observers' scores occurring within 2 s of each other within a 30-s block. The block-by-block percentage agreement (total agreements divided by total agreements plus disagreements multiplied by 100) for social avoidance behavior averaged 82% (range, 50% to 100%), and for child-preferred play averaged 87% (range, 73% to 100%).

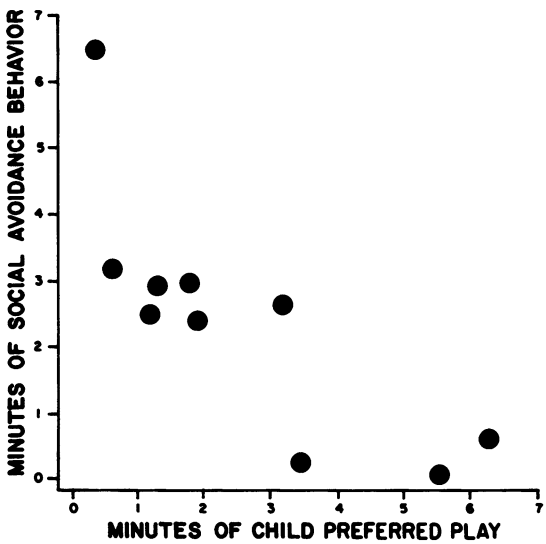

Figure 1. Results of the correlation between social avoidance behaviors and child-preferred play for each subject during the naturalistic observations.

For the data pertaining to social responsiveness, two experimentally naive observers independently rated seven of the 10 videotaped sessions. An agreement was defined as the observers' mean rating scores for a session being within one-half point of each other. The percentage of agreements for Question 1 and Question 2 were both 83%.

Data Analysis

Pearson product-moment correlation coefficients were calculated for the above dependent variables by correlating the percentage of child-preferred play with social avoidance behavior on a session-by-session basis and were also calculated for child-preferred play and each of the questions on the subjective ratings of social responsiveness, also on a session-by-session basis.

Results and Discussion

The first correlation is illustrated in Figure 1. Each data point represents one interaction session

for a given subject. The data show that when the subjects participated in relatively high amounts of child-preferred play with the adult, they displayed low levels of social avoidance behavior during the interaction. Conversely, in sessions during which there was less child-preferred play, the amount of social avoidance behavior was higher. A Pearson product-moment correlation coefficient revealed a negative correlation between child-preferred play and social avoidance behavior ($r = -0.73$, $p < .05$) across all children.

The results of the subjective rating scales, measuring the overall social responsiveness of each subject during the interactions, revealed a positive correlation between the amount of child-preferred play and level of social interest ($r = 0.91$, $p < .01$) and social involvement ($r = 0.63$, $p < .05$) during the subjects' interactions with the adults across all sessions.

STUDY 2: EXPERIMENTAL MANIPULATIONS

The results of Study 1 showed child-preferred play to be highly negatively correlated with social avoidance behavior during naturally occurring interactions between autistic individuals and adults. In order to experimentally analyze this phenomenon, child-preferred activities compared with arbitrary activities were next manipulated in the context of a repeated reversals design (Barlow & Hersen, 1984).

Method

Subjects

Subjects 1 and 2, who participated in the above correlational analyses, also participated in the experimental manipulations. Additionally, a third subject (with verbal skills) participated. This subject had the same inclusion criteria as the above participants. These 3 subjects were selected because they were, at the time of this study, consistently available for prolonged observation and because their clinicians and teachers reported their social avoidance behaviors to be especially problematic during interactions with adults.

Setting and Procedures

We manipulated child-preferred play by prompting the children to engage in this type of activity with adults who were naive as to the purpose of the study. This was compared to a condition in which the children were prompted to engage in activities that were arbitrarily determined by the adult. These prompting sessions took place in small rooms that contained materials appropriate for the verbal ability and age level of each subject. For the older, verbal individuals (Subjects 2 and 11) all three interactants (subject, therapist, and adult) sat facing each other on chairs, and child-preferred or arbitrarily determined conversational topics (see below) were discussed. For the younger, less verbal individual who spoke in short, one- to three-word utterances (Subject 1), a variety of toys were scattered on the floor, and child-preferred or arbitrarily determined play activities with those toys were carried out. Sessions were videotaped with an inconspicuously placed camera located in the clinic room. The accompanying recording equipment was out of view in an adjoining room.

Assessment of child-preferred and arbitrary activities. Assessments were conducted each day before the prompting sessions were carried out. Child-preferred activities were assessed by introducing activities that were typical for each child; this determination was made from informal interviews with individuals who were familiar with each subject. The therapist also allowed the subject to spontaneously initiate activities. Those activities that were maintained by the subject for more than 15 s during the preassessment sessions were defined as *child-preferred activities.* (This modification of the definition used in Study 1 was made because (a) we had observed that preferred activities were typically maintained for at least 15 s and (b) it made it easier for the therapist to prompt the activities and to discriminate between the conditions.) Any activity that the child did not maintain for at least 15 s was defined as an *arbitrary activity.*

The preassessment was completed when five child-preferred and five arbitrary activities were identified. The specific child-preferred and arbitrary activities that were identified across sessions are presented in Table 1. The two types of activities identified were sufficient to allow the therapist to implement the conditions differentially for each subject.

Manipulation of child-preferred and arbitrary activities. After the assessment was completed, each subject was introduced by the therapist to an adult naive to the experiment, who was instructed to be friendly and to respond to the subject with interest. Each day a different adult interacted with the subject. The adult was instructed to engage in conversation with the older, verbal subjects and in play with the younger subject.

During the child-preferred activity condition, the therapist prompted interactions (e.g., by saying to the child, "Show the toy to Mr. X.") that the subjects had engaged in for more than 15 s in the preassessment session. Responses were prompted after either a 5-s pause or after the adult started to initiate any interaction that was not in the child-preferred list. During the arbitrary *activity condition,* the therapist prompted the subject to initiate activities in which the subject had shown negligible involvement (i.e., less than 15 s) during the preassessment.

Table 1
Child-Preferred and Arbitrary Activities Assessed and Identified for the Experimental Manipulations.

	Arbitrary activities	Child-preferred activities
Subject 1 (Play activities)	Stacking ring	Toy telephone
	Storybook	Styrofoam puzzle pieces
	Crayons and paper	Tape recorder
	Wooden puzzle	Headphones
	Push toy	Balloons
	Tamborine	Tennis ball
	Airplane	Puppet
		Animal farm
Subject 2 (Conversation topics)	Homework	Food
	Family members	Places to eat
	Where you live	TV shows
	School	The Muppets
	How old you are	Trash
	Voting	Wizard of Oz
	Animals	Birthday parties
	Hair styles	Gymnastics
	Clothes	News
	Dolls	Boys and dates
Subject 11	Homework	Popular songs
	School	Musical instruments
	Work	
	Family members	Record stores
	Television	Pizza
	Christmas shopping	Vacations
	Friends	
	Reading	
	Sports	

Measurement of Dependent Variables and Reliability

Social avoidance behaviors. The duration of these behaviors was measured in a manner similar to that described in Study 1. However, because the setting was much smaller than the living room used in Study 1, the video camera focused on the subjects' faces, restricting the recording of social avoidance behaviors to the following facial expressions:

1. Gaze Aversion: The gaze is directed away from the other person and, at the same time, the gaze is not directed at a particular object (for more than 3 s).

2. Close Eyes: Lids are closed more than 3 s (not blinking).

3. Hang Head: Head is dropped down over the chest (more than 3 s).

4. Face Away: Face turned more than 45° from the adult (does not include looking at the therapist).

5. Smooth Face: Face is expressionless for more than 3 s.

6. Move Away: Child gets up and walks away from adult.

Subjective measures of social responsiveness. These were scored according to the rating scale described in Study 1, with five adult observers independently rating one (the same) randomly selected videotaped session from each experimental condition for each subject.

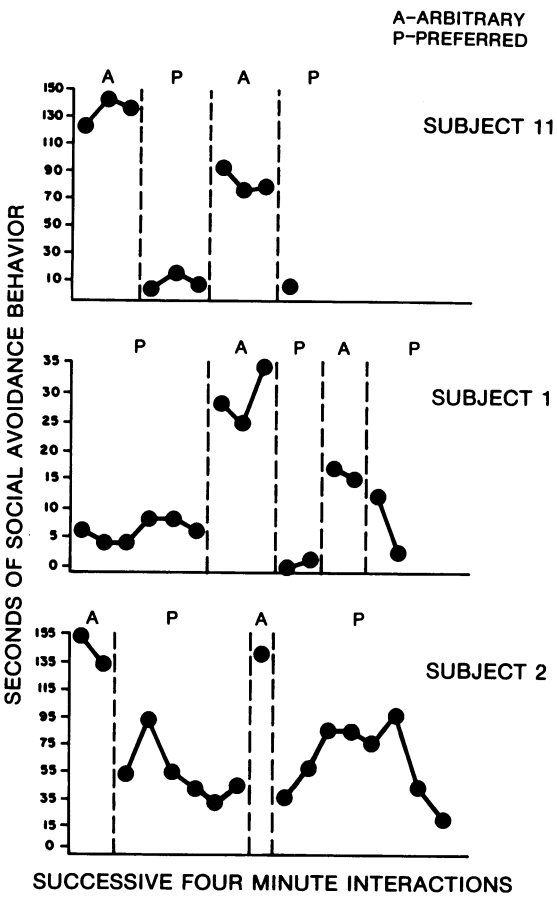

Figure 2. Results of the repeated reversal analysis measuring the influence of the child-preferred vs. arbitrary activities on the amount of social avoidance behaviors exhibited by three autistic individuals.

Reliability. The reliability measures for social avoidance behavior, recorded on a block-by-block basis in the manner described in Study 1, revealed an average percentage of agreement of 91% (range, 50% to 100%, with only 2 of the 14 measures below 88%). The subjective measures of social responsiveness across the five observers were in very high agreement, varying by less than one-half point across any two observers.

Results and Discussion

Figure 2 shows the number of seconds of social avoidance behaviors during each successive 4-min interaction for each experimental condition in the repeated reversals analyses. The data show that each subject exhibited low levels of social avoidance behaviors during the child-preferred activity condition. Subject 11 showed high levels of avoidance behaviors (averaging 134 s per 4-min segment) during the first arbitrary interaction condition (as presented in the first graph). A reversal to the child-preferred activity condition produced an immediate decrease in social avoidance behaviors, averaging 9 s per 4 min of social interaction. Another reversal to the arbitrary activity condition produced a subsequent increase to an average of 83 s of social avoidance behaviors. This was followed by a final reversal to the child-preferred activity condition, yielding a decrease to 6 s of social avoidance behaviors.

Examination of the remaining two graphs reveals essentially the same effects for the other two subjects; that is, the child-preferred activity condition always produced lower levels of social avoidance behaviors than the arbitrary activity condition.

The average subjective rating scores from the observers showed that each subject was rated as more interested and actively involved in the social interactions during the child-preferred activity condition as compared to the arbitrary activity condition. The mean ratings on the question, "How interested did this child seem in continuing this interaction?" in the arbitrary (preferred) conditions were 3.1 (4.5) for Subject 1, 1.9 (4.1) for Subject 2, and 2.0 (3.9) for Subject 11. The mean ratings on the question, "How actively involved was the child in this interaction?" were 3.7 (4.2) for Subject 1, 2.0 (4.3) for Subject 2, and 2.5 (4.0) for Subject 11.

Overall, the results of Study 2 suggest that child-preferred activities can be prompted, and that such activities will positively influence the children's social behavior during interactions with adults. It is important to note that all the adults had different interaction styles, with some adults naturally following the child's lead, and others predominantly initiating arbitrary topics. However, because each child was prompted to redirect the interaction toward child-preferred activities when an arbitrary adult-determined activity was introduced, a con-

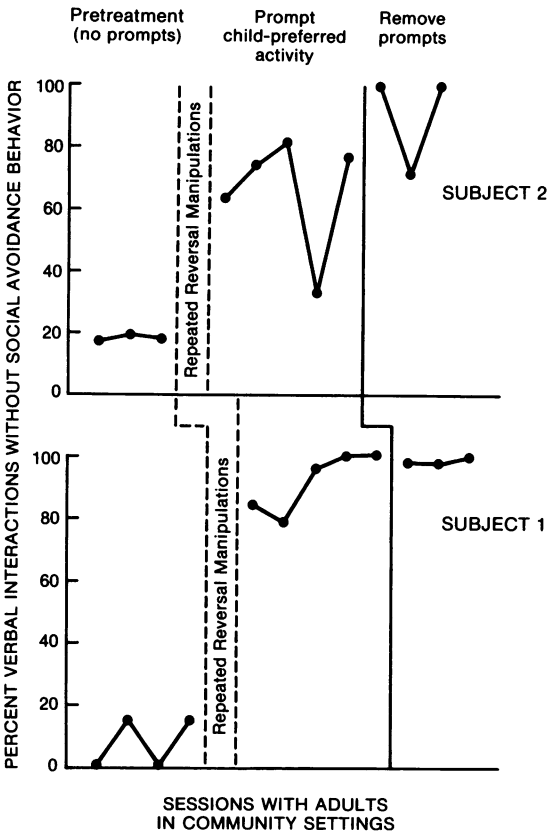

Figure 3. Results of the community intervention showing the reduction of social avoidance behavior in community settings after the prompts to initiate child-preferred activities in those settings were removed.

sistently high level of child-preferred activities was ensured throughout these sessions.

STUDY 3: COMMUNITY MANIPULATIONS

In Study 3 we prompted child-preferred activities and assessed the social behavior of Subjects 1 and 2 in community settings. Therefore, after the repeated reversal analysis in Study 2 was completed, the prompts were presented and then systematically removed for those 2 subjects in the community.

Method

Setting and Procedures

All sessions in the community took place at either a hamburger stand, the university cafeteria, or a walkway and patio connecting the clinic and the cafeteria. In these community settings during the pretreatment baselines and the final posttreatment sessions, no prompts of any kind were delivered. The sessions were conducted approximately once per week. Following the pretreatment sessions (and the repeated reversals, which were conducted separately in the laboratory in Study 2), the therapist continued to prompt child-preferred activities that were appropriate to the community settings. Then all prompts were removed after the subjects reached a predetermined criterion of responding in the community setting (see below). During the sessions, the older, verbal subject was prompted to engage in a limited repertoire of conversational topics including TV shows, popular music, and gymnastics. The activities for the younger, less verbal subject included playing catch with a football and "shooting baskets." Each activity took place in an appropriate setting. For example, all the ball games were played on the patio, and the conversations were carried out at all of the above settings. After the subjects averaged at least 66% appropriate social behavior across five prompted sessions, the therapist's prompts for initiating child-preferred activities were removed completely; the sessions were then identical to the baseline sessions.

Measurement of Dependent Variables and Reliability

The dependent variables in the community settings consisted of the social avoidance behaviors listed in Study 2. However, as the need to be unobtrusive in the outdoor community setting precluded the use of video equipment, the observers recorded occurrences of social avoidance during each verbal interaction between the subject and the adult. A verbal interaction was defined as an utterance spoken by the subject to the adult, or vice versa. For example, if while the adult was saying, "How are you?" the subject exhibited gaze aversion, this interaction was scored as an instance of social avoidance behavior. The percentage of agreement for these measures averaged 95% (range, 91% to 100%).

Results

Results of the community manipulations are shown in Figure 3. The data show that both subjects showed improvements in percentages of interactions without social avoidance behavior after the treatment was conducted. Both subjects displayed low percentages of intervals without social avoidance behavior during the pretreatment baseline sessions. The percentage of intervals without social avoidance behavior during the unprompted verbal interactions with adults averaged 18% for Subject 2 and 8% for Subject 1. When the therapist prompted the subjects to initiate child-preferred activities, the percentage of intervals without social avoidance behavior increased to a high of 77% and 100% for Subjects 2 and 1, respectively. These increases were maintained (M = 91% and 98.5%, respectively) upon removal of the therapist's prompts. These improvements reflect both decreases in the number of interactions with social avoidance behavior and increases in the number of interactions without social avoidance behavior, with the total number of interactions per session remaining relatively constant (typically 25 to 60 interactions for Subject 1 and 15 to 30 interactions for Subject 2). By the end of the experiment, both subjects were exhibiting no interactions with social avoidance behavior.

GENERAL DISCUSSION

Results of this investigation first showed that child-preferred activities and social avoidance behaviors were significantly negatively correlated in terms of both objectively scored behavior and subjective ratings of social responsiveness in unmanipulated settings. Additional analyses then showed that the children could be prompted to initiate child-preferred activities, and that these prompts could be removed in community settings with maintained reductions of social avoidance responses to all of the adults who interacted with them.

These findings can be discussed in relation to several issues. First, researchers have asserted that the spontaneous communicative behavior of both normal and autistic populations is not consistent but varies systematically with the communicative context (Bruner, 1975; Wolchik & Harris, 1982). For example, Bernard-Opitz (1982) found that an autistic child's communicative initiations improved if the mother responded to the child's initiations in comparison to mother-initiated communicative interactions.

This finding is consistent with a report by Wetherby and Prutting (1984), who also found that autistic children frequently initiated communication with adults in a free-play setting. Their report was inconsistent with anecdotal reports in the literature that autistic children lack spontaneous communication. The authors hypothesized that this discrepancy in the children's behavior might have been due to the fact that the adult in their study was nondirective, which allowed opportunities for the child to engage in child-preferred activities rather than in activities that were arbitrarily determined by the adult. Results of our studies support this hypothesis.

Conceptually, the results suggest that the children engaged in social avoidance behavior to terminate interactions that were nonreinforcing, possibly due to the lack of direction that they were allowed. This hypothesis ties into a growing body of literature suggesting that children with learning handicaps experience repeated exposure to failure in social situations, which serves to increase social avoidance behavior (Churchill, 1971; Koegel & Egel, 1979; Koegel & Mentis, 1985; MacMillan, 1971; Zigler, 1966). Such behavior would be negatively reinforced by the termination of a demanding social situation (cf. Carr, Newsom, & Binkoff, 1976), and would also prove to be highly resistant to extinction, because the child would fail to be exposed to reinforcing social interactions.

If this were the case, it would not be surprising if the converse were also true; that is, if a child were allowed to engage in preferred activities and therefore experience success, positive reinforcement would be obtained. Because severely handicapped children tend to react to even neutral events as failures (MacMillan, 1971), the early stages of a

treatment program might be more effective if they are designed to maximize the child's chance for success. Although the reliability of the independent variable was not measured directly, results of our study suggest that by prompting the subjects to initiate child-preferred activities with adults who were instructed to be friendly, the subjects may have been exposed to a high density of reinforcing interactions.

Further, the literature has shown that it is possible to extinguish avoidance behaviors through the pairing of positive reinforcing events with conditioned aversive stimuli (Wolpe, 1969). The lack of avoidance behavior shown by these subjects towards naive adults during nonprompted interactions after treatment provides evidence for the success of this type of intervention. Additionally, these subjects continued to initiate child-preferred interactions with adults after the prompts to do so were withdrawn. Thus, this behavior may have exposed them to a partial reinforcement schedule. Such schedules typically result in highly durable levels of responding (see Koegel & Rincover, 1977), and may be responsible for the durability of the social approach behavior that was demonstrated by both subjects.

Thus, the results of this study have important implications for the treatment of the severe social unresponsiveness that is characteristic of autistic children. The results are consistent with those of other studies (cf. Koegel, O'Dell, & Koegel, 1987), which suggest that if these children's activities are modified to allow the child shared control in teaching activities, improvements in speech can occur. Perhaps shared control results in higher motivation in these children to approach social and learning situations in general, instead of spending a large percentage of their time engaging in avoidance activities.

REFERENCES

Barlow, D. H., & Hersen, M. (1984). *Single case experimental designs* (2nd Ed.). New York: Pergamon Press.

Bernard-Opitz, V. (1982). Pragmatic analysis of the communicative behavior of an autistic child. *Journal of Speech and Hearing Disorders,* **47,** 99–109.

Bruner, J. (1975). The otogenesis of speech acts. *Journal of Child Language,* **2,** 1–19.

Carr, E. G., Newsom, C. D., & Binkoff, J. A. (1976). Stimulus control of self-destructive behavior in a psychotic child. *Journal of Abnormal Child Psychology,* **4,** 139–153.

Churchill, D. W. (1971). The effects of success and failure in psychotic children. *Archives of General Psychiatry,* **25,** 208–214.

Dawson, G., & Adams, A. H. (1984). Imitation and social responsiveness in autistic children. *Journal of Abnormal Child Psychology,* **12,** 209–266.

Duchan, J. F. (1983). Autistic children are noninteractive: Or so we say. *Seminars in Speech and Language,* **4,** 53–61.

Gaylord-Ross, R. J., Haring, T. G., Breen, C., Lee, M., & Pitts-Conway, V. (1984). The training and generalization of social interaction skills with autistic youth. *Journal of Applied Behavior Analysis,* **17,** 229–247.

Hops, H. (1983). Children's social competence and skill: Current research practices and future directions. *Behavior Therapy,* **14,** 3–18.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child,* **3,** 217–250.

Koegel, R. L., & Egel, A. L. (1979). Motivating autistic children. *Journal of Abnormal Psychology,* **88,** 418–426.

Koegel, R. L., & Mentis, M. (1985). Motivation in childhood autism: Can they or won't they? *The Journal of Child Psychology and Psychiatry and Allied Disciplines,* **26,** 185–191.

Koegel, R. L., O'Dell, M. C., & Koegel, L. K. (1987). A natural language teaching paradigm for non-verbal autistic children. *Journal of Autism and Developmental Disorders,* **17,** 187–200.

Koegel, R. L., & Rincover, A. (1977). Research on the difference between generalization and maintenance in extra-therapy responding. *Journal of Applied Behavior Analysis,* **10,** 1–12.

MacMillan, D. L. (1971). The problem of motivation in the education of the mentally retarded. *Exceptional Children,* **37,** 579–586.

McConnell, O. L. (1967). Control of eye contact in an autistic child. *Journal of Child Psychology and Psychiatry,* **8,** 249–255.

Piaget, J. (1962). *Play, dreams, and imitation in childhood.* New York: Norton.

Richer, J. M., & Coss, R. G. (1976). Gaze aversion in autistic and normal children. *Acta Psychiatricia Scandinavica,* **53,** 193–210.

Ritvo, E. R., & Freeman, B. J. (1978). National Society for Autistic Children definition of the syndrome of autism. *Journal of Autism and Childhood Schizophrenia,* **8,** 162–167.

Schreibman, L., Koegel, R. L., Charlop, M. H., & Egel, A. L. (1982). Autism. In A. S. Bellack, M. Hersen, & A.

E. Kazdin (Eds.), *International handbook of behavior modification and therapy* (pp. 891–916). New York: Plenum Press.

Shafer, M. S., Egel, A. L., & Neef, N. A. (1984). Training mildly handicapped peers to facilitate changes in the social interaction skills of autistic children. *Journal of Applied Behavior Analysis,* **17,** 461–476.

Strain, P. S., Kerr, M. M., & Ragland, E. U. (1979). Effects of peer mediated social interaction and prompting/reinforcing procedures on the social behavior of autistic children. *Journal of Autism and Developmental Disorders,* **9,** 41–54.

Sulzer-Azaroff, B., & Mayer, G. R. (1977). *Applying behavior analysis procedures with children and youth.* New York: Holt, Rinehart, and Winston.

Wetherby, A. M., & Prutting, C. A. (1984). Profiles of communicative and cognitive-social abilities in autistic children. *Journal of Speech and Hearing Research,* **27,** 364–377.

Wolchik, S. A., & Harris, S. L. (1982). Language environments of autistic and normal children matched for language age: A preliminary investigation. *Journal of Autism and Developmental Disorders,* **12,** 43–55.

Wolpe, J. (1969). *Practice of behavior therapy.* New York: Pergamon Press.

Zigler, E. (1966). Motivational determinants in the performance of retarded children. *American Journal of Orthopsychiatry,* **36,** 848–856.

Received August 1, 1986
Initial editorial decision November 4, 1986
Revisions received March 9, 1987; April 29, 1987
Final acceptance May 22, 1987
Action Editor, Nancy A. Neef